

The following is claimed:

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- 1 1. A speech encoding system comprising:
- 2 a detector for detecting whether an input speech signal generally has a
- 3 triggering characteristic during an interval;
- 4 an encoder supporting at least one of a first encoding scheme and a first
- 5 encoding scheme applicable to the speech signal for a frame associated with the
- 6 interval, the first encoding scheme having a pre-processing procedure for processing the
- 7 inputted speech signal to form a revised speech signal biased toward a generally ideal
- 8 voiced and stationary characteristic; and
- 9 a selector for selecting one of the first encoding scheme and the
- 10 second encoding scheme based upon the detection or absence of the triggering
- 11 characteristic in the interval of the input speech signal.
- 1 2. The speech encoding system according to claim 1 where the triggering
- 2 characteristic comprises a generally voiced and generally stationary speech
- 3 component of the speech signal.
- 1 3. The speech encoding system according to claim 1 where the selector
- 2 selects the first encoding scheme if the detector determines that the speech signal is
- 3 generally stationary and generally periodic during the frame.
- 1 4. The speech encoding system according to claim 1 where the selector
- 2 selects the second encoding scheme if the detector determines that the speech signal
- 3 is generally nonstationary during the frame.
- 1 5. The speech encoding system according to claim 1 further comprising:
- 2 a perceptual weighting filter for filtering the input speech signal;
- 3 a pitch-preprocessing module having an input coupled to an output of
- 4 the perceptual weighting filter, the pitch pre-processing module determining a target
- 5 signal for time warping the weighted speech signal.
- 1 6. The speech encoding system according to claim 1 further comprising a
- 2 pitch pre-processing module for determining an input pitch track based on multiple

3 frames of the speech signal and altering variations in the pitch lag associated with
4 samples to track the input pitch track.

1 7. The speech encoding system according to claim 1 where the first encoding
2 scheme has a first allocation of storage units per frame between a fixed codebook
3 index and an adaptive codebook index, the second scheme having a second
4 allocation of storage units per the frame between the fixed codebook index and the
5 adaptive codebook index, where the first allocation differs from the second
6 allocation.

1 8. The speech encoding system according to claim 7 where the second
2 allocation of storage units per frame allocates a greater number of storage units to
3 the adaptive codebook index than the first allocation of storage units to facilitate
4 long-term predictive coding on a subframe-by-subframe basis.

1 9. The speech encoding system according to claim 7 where the first
2 allocation of storage units per frame allocates a greater number of storage units for
3 the fixed codebook index than the second allocation does to reduce a quantization
4 error associated with the fixed codebook index.

1 10. The speech encoding system according to claim 7 where the second
2 encoding scheme has a higher allocation ratio than the first encoding scheme, the
3 allocation ratio defined by a number of storage units allocated to the adaptive
4 codebook index divided by the number of storage units allocated to the adaptive
5 codebook index plus the fixed codebook index.

1 11. The speech encoding system according to claim 7 where, for full-rate
2 coding, the first encoding scheme supports a first frame type and the second
3 encoding scheme supports a second frame type different from the first frame type.

1 12. The speech encoding system according to claim 7 where, for higher-rate
2 coding, the first encoding scheme supports a first frame type and the second
3 encoding scheme supports a second frame type, and for lower-rate coding the
4 encoder supports a third frame type and a fourth frame type.

1 13. A speech encoding system comprising:

2 a detector for detecting whether an input speech signal generally has a
3 generally voiced and generally stationary characteristic during an interval;

4 an encoder supporting at least one of a first encoding scheme and a
5 second encoding scheme applicable to the speech signal for a frame associated with
6 the interval, the second encoding scheme having long-term prediction procedure for
7 processing the inputted speech signal on a sub-frame-by-subframe basis;

8 a selector for selecting one of the first encoding scheme and the
9 second encoding scheme based upon said detection or absence of the generally
10 voiced and generally stationary characteristic in the interval of the input speech
11 signal.

1 14. The speech encoding system according to claim 13 where the selector
2 selects the second encoding scheme if the detector determines that the speech signal
3 is not generally periodic during the frame.

1 15. The speech encoding system according to claim 13 where the selector
2 selects the second encoding scheme if the detector determines that the speech signal
3 is generally nonstationary during the frame.

1 16. The speech encoding system according to claim 13 where the second
2 encoding scheme has a pitch track with a greater number of bits per frame than the
3 first encoding scheme to represent the pitch track.

1 17. A speech encoding method comprising the steps of:

2 detecting whether an input speech signal has a triggering
3 characteristic during an interval;

4 selecting one of a first encoding scheme and a second encoding
5 scheme, for application to the input speech signal for a frame associated with the
6 interval, based upon said detection of the triggering characteristic; and

7 processing the inputted speech signal in accordance with the first
8 encoding scheme to form a revised speech signal biased toward a generally ideal
9 voiced and stationary characteristic if the triggering characteristic is detected in the
10 input speech signal.

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1 18. The method according to claim 17 where the detecting step comprises
2 detecting whether the input speech signal generally has a generally voiced and
3 generally stationary component as the triggering characteristic during an interval.

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1 19. The method according to claim 17 further comprising the step of
2 supporting the first encoding scheme having a first allocation of storage units per the
3 frame between a fixed codebook index and an adaptive codebook index, the second
4 encoding scheme having a second allocation of storage units per the frame between
5 the fixed codebook index and the adaptive codebook index, where the second
6 allocation differs from the first allocation

1 20. The method according to claim 17 further comprising the step of
2 processing the inputted speech signal on a sub-frame-by-subframe basis in
3 accordance with a long-term prediction procedure of the second encoding scheme if
4 the triggering characteristic is not detected during the interval.

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